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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/602,374	06/23/2000	Jussi Ruutu	975.305USW1	1766

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EXAMINER

LY, ANH VU H

ART UNIT	PAPER NUMBER
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2662

DATE MAILED: 06/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/602,374

Applicant(s)

RUUTU ET AL.

Examiner

Anh-Vu H Ly

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 and 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art disclosed in the specification under the background of the invention on pages 1-2 in view of Helm et al (US Patent No. 5,790,605) and further in view of Cox (US Patent No. 5,844,891). Hereinafter, referred to as Helm and Cox.

With respect to claims 1 and 7, the admitted prior art discloses on page 1, lines 20-24 that in future ATM based GSM networks, a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2.

The admitted prior art further discloses on page 2, lines 4-12 that without synchronizing, the frequencies of the transmitting clock and the receiving clock are not equal. Therefore, an overflow or underflow may occur at the buffer in the receiver.

The admitted prior art does not disclose a clock generating method comprises the steps of determining a plurality of actual signal arrival times; averaging plurality of actual signal arrival times; and correcting a timing of a receiving clock on the basis of average of the signal arrival times and an expected signal arrival time.

Helm discloses (see Abstract) that a plurality of frame sets corresponding to a message are received by a time stamper such that frames within each frame set are time stamped (determining a plurality of actual signal arrival times).

Further, Helm discloses that an arrival time differentiator determines arrival time differentials for each frame set based on time stamps. An averager averages arrival time differentials together (averaging plurality of actual signal arrival times).

Cox discloses (col. 2, lines 6-14) that if the receiver's output clock is slower than the sender's input clock, then the buffer fill-level will tend to increase with time.

Conversely, if the receiver's output clock is faster than the sender's input clock, then the buffer fill-level will tend to decrease with time. The output clock can thus be adjusted based on trends in the buffer fill-level.

Cox discloses (col. 3, lines 30-45) a clock recovery function in the receiving entity of a system to implement adaptation services over ATM or ATM-like network. Wherein, comprising a buffer for receiving incoming cells and a frequency adjustment logic unit providing at its output a control signal at a given clock frequency. The frequency adjustment logic unit making incremental adjustments to the clock frequency  $f$  to cause the steady state mean of the buffer fill level on arrival of undelayed cells or its derivative, to move toward a predefined optimal operating point  $L_{opt}$  (correcting a timing of a receiving clock on the basis of average of signal arrival times and an expected signal arrival time).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Cox, which disclosed a

frequency adjustment logic unit to make adjustment to the clock frequency, and Helm, which discloses time stamped on frame sets and averaged time differentials and the admitted prior art to provide a clock recovery function in the receiving entity of a system such as GSM system to adjust an overflow and/or underflow in the buffer in the receiving entity caused by time differences.

With respect to claim 2, the admitted prior art discloses in Fig. 1B, a receiving clock within a receiver (expected signal arrival time is derived from receiving clock).

With respect to claim 3, the admitted prior art discloses on page 1, lines 20-24 that in future ATM based GSM networks, a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2.

The admitted prior art further discloses on page 2, lines 4-12 that without synchronizing, the frequencies of the transmitting clock and the receiving clock are not equal. Therefore, an overflow or underflow may occur at the buffer in the receiver.

The admitted prior art does not disclose wherein determining step comprises counting a time period between the arrival of a first and the arrival of a subsequent second signal.

Helm discloses that an arrival time differentiator determines arrival time differentials for each frame set based on time stamps (counting a time period between the arrival of a first and the arrival of subsequent second signal).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include an arrival time differentiator in the admitted prior art, as disclosed by Helm, to determine the arrival time differentials for each frame set, in the receiving entity of a system such as GSM system to adjust an overflow and/or underflow in the buffer in the receiving entity caused by time differences.

With respect to claim 4, the admitted prior art discloses on page 1, lines 20-24 that in future ATM based GSM networks, a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2.

The admitted prior art further discloses on page 2, lines 4-12 that without synchronizing, the frequencies of the transmitting clock and the receiving clock are not equal. Therefore, an overflow or underflow may occur at the buffer in the receiver.

The admitted prior art does not disclose wherein averaging step comprises storing counted time periods and calculating an average of stored time periods.

Helm discloses in Figure 1, memory devices 118 and 120 for storing information. Further, as noted in claim 1, Helm discloses that an arrival time differentiator determines arrival time differentials for each frame set based on time stamps. An averager averages arrival time differentials together. This means, a memory is needed to store arrival stamped signals for differentiating (storing counted time periods and calculating an average stored time periods).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include an arrival time differentiator and memory devices in the admitted prior art, as disclosed by Helm, to determine the arrival time differentials for each frame set, in the receiving entity of a system such as GSM system to adjust an overflow and/or underflow in the buffer in the receiving entity caused by time differences.

With respect to claim 5, the limitations recited in claim 5 are addressed in the rejection of parent claim 1.

With respect to claim 6, the admitted prior art discloses on page 1, lines 20-29 that in future ATM based GSM networks (asynchronous transmission is an ATM transmission), a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2. The admitted prior art further discloses that in an ATM connection, bit streams of binary signals of different channels are divided into unitary ATM cells to be transmitted in a time divisional manner (signal is an ATM cell).

With respect to claim 8, the admitted prior art discloses on page 1, lines 20-24 that in future ATM based GSM networks, a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2.

The admitted prior art further discloses on page 2, lines 4-12 that without synchronizing, the frequencies of the transmitting clock and the receiving clock are not equal. Therefore, an overflow or underflow may occur at the buffer in the receiver.

The admitted prior art does not disclose correcting means comprises a voltage-controlled oscillator.

Cox discloses in Fig. 3, a digital phase locked loop. It is well known in the art, a PLL contains a VCO (voltage controlled oscillator).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a PLL in the admitted prior art, as disclosed by Cox, to adjust an overflow and/or underflow in the buffer in the receiving entity caused by time differences.

With respect to claim 9, the limitations recited in claim 9 are addressed in the rejection of parent claim 7.

With respect to claim 10, the admitted prior art discloses on page 1, lines 20-24 that in future ATM based GSM networks, a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2.

The admitted prior art further discloses on page 2, lines 4-12 that without synchronizing, the frequencies of the transmitting clock and the receiving clock are not equal. Therefore, an overflow or underflow may occur at the buffer in the receiver.



The admitted prior art does not disclose storing means for storing plurality of detected actual signal arrival time.

Helm discloses in Figure 1, memory devices 118 and 120 for storing information. Further, as noted in claim 7, Helm discloses that an arrival time differentiator determines arrival time differentials for each frame set based on time stamps. An averager averages arrival time differentials together. This means, a memory is needed to store arrival stamped signals for differentiating (determining means comprises storing means for storing plurality of detected actual signal arrival time).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include an arrival time differentiator and memory devices in the admitted prior art, as disclosed by Helm, to determine the arrival time differentials for each frame set, in the receiving entity of a system such as GSM system to adjust an overflow and/or underflow in the buffer in the receiving entity caused by time differences.

With respect to claim 11, the admitted prior art discloses in Fig. 1B, a receiving clock within a receiver (detecting means comprises timer).

With respect to claim 12, the admitted prior art discloses on page 1, lines 20-24 that in future ATM based GSM networks, a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver 2.

The admitted prior art further discloses on page 2, lines 4-12 that without synchronizing, the frequencies of the transmitting clock and the receiving clock are not equal. Therefore, an overflow or underflow may occur at the buffer in the receiver.

The admitted prior art does not disclose correction control means comprises a phase detector, and wherein a polarity of control signal is changed in accordance with the result of comparison.

Cox discloses in Fig. 3, a digital phase locked loop-like structure. It is well known in the art, a PLL contains a VCO. Further, as noted in the rejection statements of claim 7, Cox discloses a frequency adjustment logic unit providing at its output a control signal at a given clock frequency. The frequency adjustment logic unit making incremental adjustments to the clock frequency  $f$  to cause the steady state mean of the buffer fill level on arrival of undelayed cells or its derivative, to move toward a predefined optimal operating point  $L_{opt}$ .

Further, Cox discloses (col. 7, lines 5-21) that since the element  $1/(z-1)$  is an integrator, the buffer fill-level is the integral of the frequency difference, and thus is effectively the phase error of the loop (phase detector and wherein a polarity of control signal is changed in accordance with the result of comparison).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a frequency adjustment logic unit in the admitted prior art, as disclosed by Cox, to adjust an overflow and/or underflow in the buffer in the receiving entity caused by time differences.

With respect to claim 13, the admitted prior art discloses on page 1, lines 20-29 that in future ATM based GSM networks (asynchronous transmission is an ATM transmission), a transcoder and a Base Transceiver Station are connected via an asynchronous ATM connection, wherein synchronization is not available at the receiver

2. The admitted prior art further discloses that in an ATM connection, bit streams of binary signals of different channels are divided into unitary ATM cells to be transmitted in a time divisional manner (signal is an ATM cell).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Petch et al (US Patent No. 6,243,372) discloses methods and apparatus for synchronization in a wireless network.

Yamawaki (US Patent No. 5,875,402) discloses time-synchronous communication system.

Westerlage et al (US Patent No. 5,724,243) discloses a method and apparatus for determining expected time of arrival.


Guo et al (US Patent No. 5,452,333) discloses digital jitter correction method and signal preconditioner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh-Vu H Ly whose telephone number is 703-306-5675. The examiner can normally be reached on Monday-Friday 7:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 703-305-4744. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

av  
June 13, 2002



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